

AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph beginning at page 1, line 6, as follows:

The present ~~invention technology~~ relates to an image forming apparatus. Specifically, it relates to improving a processing operation when there are not enough sheets remaining in a paper feed cassette to satisfy the requested number of image forming sheets.

Please amend the paragraph beginning at page 4, line 3, as follows:

The present ~~invention technology~~ was made with the foregoing in mind, and it is an object thereof to provide an image forming apparatus wherein a state is not incurred in which, if a user gives an image forming request when there are few sheets of paper remaining in the paper feed cassette, the supply is exhausted during the image forming operation, and the user must move to the location in which the image forming apparatus is installed and perform a confirmation operation, nor a state in which an operation of the user is temporarily interrupted.

Please amend the paragraph beginning at page 4, line 12, as follows:

DISCLOSURE OF ~~INVENTION~~PRESENT TECHNOLOGY

– Overview of the ~~Invention~~Present Technology. –

In order to achieve the object stated above, in accordance with the present ~~invention technology~~, if there are not enough sheets remaining in the paper feed cassette to satisfy an image forming request when forming an image, waits for a paper refill is awaited without executing the image forming operation, and the image forming operation is begun after that paper refill. When awaiting this paper refill, along with prompting the user to refill the paper, the paper feed cassette is popped out and the lack of paper can easily be confirmed.

Please amend the paragraph beginning at page 9, line 20, as follows:

FIG. 1 is a drawing that schematically shows an internal structure of a compound machine according to an ~~example~~embodiment.

Please amend the paragraph beginning at page 10 line 7, as follows:

FIG. 9 is cross-sectional view that shows a part of the interior of the paper feed cassette according to a second example embodiment.

Please amend the paragraph beginning at page 10, line 13, as follows:

BEST MODE FOR CARRYING OUT THE ~~INVENTION~~PRESENT TECHNOLOGY

Hereinafter, the present ~~invention-technology~~ will be described by way of illustrative embodiments with reference to the drawings. In the present example embodiment, the present ~~invention-technology~~ is described with regard to its application in a compound machine provided with a copy function, a print function, and a facsimile function. In these example embodiments, any paper such as image forming paper or recording paper can be used as a recording medium, but the recording medium is not restricted to these. Other forms of recording media may also be used, such as overhead projector sheets, for example.

Please amend the paragraph beginning at page 10, line 23, as follows:

Example Embodiment 1

Please amend the paragraph beginning at page 10, line 25, as follows:

FIG. 1 schematically shows an overview of the internal structure of a compound machine 1 as an image forming apparatus according to the present example embodiment. As shown in FIG. 1, the compound machine 1 includes a scanner portion 2, a print portion 3 as an image forming portion, and an automatic original paper feed portion 4. These parts are described below.

Please amend the paragraph beginning at page 17, line 25, as follows:

The following is an explanation of the paper feed cassette 33, which is one characteristic portion of the present example embodiment. FIG. 2 is a cross-sectional view that omits part of the paper feed cassette 33 provided in this compound machine 1. The left of the diagram is the direction that the paper feed cassette 33 is pulled out when it is pulled out from the main body of the apparatus (the direction shown by the arrow).

Please amend the paragraph beginning at page 20, line 15, as follows:

FIG. 4(a) shows the relationship between the distance to the reflective surface when the light-receiving portion 72 detects the reflective surface of the light and the output level corresponding to the amount of light received. In this example embodiment, among the properties of this light receiving portion 72, it is made such that the number of sheets of paper in the paper feed cassette 33 can be confirmed using the region in which the amount of light received gradually decreases as the distance to the reflective face increases (see FIG. 4(b)). That is, when the amount of light received is I in the figure, it is confirmed that the paper feed cassette 33 is full of recording paper P, and when the amount of light received is II, it is confirmed that the paper feed cassette 33 is empty. Also, when the amount of light received is between I and II, the number of sheets of recording paper P is confirmed according to that amount of light received. For example, in a paper feed cassette that can store 500 sheets of recording paper P, when the amount of light received is III, it is confirmed that there are 250 sheets of recording paper P stored in the paper feed cassette 33.

Please amend the paragraph beginning at page 21, line 1, as follows:

In the present example embodiment, the light emitting portion 71 and the light receiving portion 72 are disposed in the approximately V-shaped concave portion 73, but as shown in FIG. 5, the light emitting portion 71 and the light receiving portion 72 may also be disposed on the same flat surface.

Please amend the paragraph beginning at page 22, line 10, as follows:

– Description of the an Example Control Portion/Control Means –

~~A~~An unshown control portion/control means 93 that performs overall control over this compound machine 1 receives a signal from the light receiving portion 72, and is switched between an excited and an unexcited state of the solenoid 85 of the engaging mechanism 82. Specifically, this control portion 93 causes the number of sheets of recording paper P stored in the paper feed cassette 33 to be confirmed by the reflective optical sensor 7 when an image forming request is received from a terminal device, and when the number of sheets of recording paper P stored in the paper feed cassette 33 is lower than the requested number of image forming

sheets, causes the paper feed cassette 33 to be pushed out from an installed state toward an uninstalled state by the push-out mechanism 8, without executing an image forming operation. That is, it puts the paper feed cassette 33 in a released state by exciting the solenoid 85, and thereby causes the paper feed cassette to be pushed out in the direction such that it is uninstalled (the push-out direction).

Please amend the paragraph beginning at page 22, line 25, as follows:

Also, the main compound machine 1 is provided with a warning means 94 that can emit a warning to a user (terminal device) that has made an image forming request, and when putting the paper feed cassette in a released state, gives a warning to the user with the warning means 94 to the effect that the number of sheets of recording paper is insufficient. Specifically, it displays a message such as “There is not enough paper” on the display of the terminal device that the user is operating. And, besides the message display on the terminal device that the user is operating, as another example, a warning means 94 may also be configured wherein an auditory warning is given to the user from the main compound machine 1, and further, a warning means 94 may also be configured wherein a message display and an auditory warning are given to the user.

Please amend the paragraph beginning at page 24, line 16, as follows:

– Effect of Example Embodiment –

As explained above, in the present example embodiment, when the number of sheets of paper remaining in the paper feed cassette 33, confirmed by the reflective optical sensor 7, is lower than the requested number of image forming sheets, that is, in a circumstance in which paper will run out during execution if an image forming operation is executed as-is, without beginning an image forming operation, along with pushing the paper feed cassette out from an installed state toward an uninstalled state with the push-out mechanism 8, a warning is given to the user by a warning means 94 to the effect that the number of sheets of recording paper is insufficient. Thus the user, after sending a print request, immediately confirms that a refill of the recording paper is necessary, and it is possible to immediately begin the work of refilling the paper without requiring the user to check the status of the compound machine 1. Accordingly, when the refill recording paper is stored in a different location than the compound machine 1 is

installed, it is possible for the user to go to the storage location of the refill recording paper to get recording paper, without going to the installed location of the compound machine 1, then go to the installed location of the compound machine 1 and perform the work of refilling the paper. That is, the activity of approaching the installed location of the compound machine 1 and confirming that there is no paper, remaining prior to going to get recording paper from the storage location, is no longer necessary. After sending an image request signal from the terminal to the compound machine 1, it is possible to allow the user to confirm the lack of paper within a short period of time. That is, after the user has sent an image request signal and before beginning separate work on that terminal, it is possible to prompt the user for a paper refill as necessary, and so it is possible to avoid temporarily interrupting work on the terminal.

Please amend the paragraph beginning at page 25, line 22, as follows:

Second Example Embodiment

Next is an explanation of a second example embodiment of the present ~~invention~~ technology. In the first example embodiment described above, the reflective optical sensor 7 was adopted as a sheet quantity checking means that checks the number of sheets of recording paper that are in the paper feed cassette 33. This second example embodiment is a modified example of this sheet quantity checking means, and in other respects the configuration of this second example embodiment is the same as in the first example embodiment described above. Accordingly, only points differing from the first example embodiment will be explained.

Please amend the paragraph beginning at page 26, line 2, as follows:

FIG. 9 is a cross-sectional view that shows a part of the interior of the paper feed cassette 33 according to the present example embodiment, which shows the structure for checking the number of recording sheets in the paper feed cassette 33. As shown in FIG. 9, the sheet quantity checking means 9 is provided with a direct current power source 91 that applies a direct current voltage across the aforementioned coil spring 33c, rotating board 33b, and paper leading edge matching portion 33d, and an electrical current sensor that detects its electrical current value.

Please amend the paragraph beginning at page 27, line 1, as follows:

In this way, the present example embodiment effectively applies the fact that, from the related art, the rotating board 33b and the paper leading edge matching portion 33d are made of metal. By utilizing the fact that the electrical resistance changes according to the position of rotation of the rotating board 33b, because the position at which the rotating board 33b makes contact with the paper leading edge matching portion 33d changes, it is possible to confirm the number of sheets of recording paper without requiring a special electric circuit.

Please amend the paragraph beginning at page 27, line 9, as follows:

– Other Example Embodiments –

In the example embodiments described above, the present ~~invention-technology~~ was described with respect to its application in the multifunction-type image forming apparatus (compound machine) 1 including functions as a copy machine and printer and facsimile apparatuses. The present invention is not restricted to this, and can also be applied in an image forming apparatus provided with only some single function, or in another image forming apparatus.

Please amend the paragraph beginning at page 27, line 17, as follows:

And, in the example embodiments described above, a configuration was adopted wherein the number of sheets of paper in the paper feed cassette 33 is confirmed based on the electrical resistance from the reflective optical sensor 7 and the coil spring 33c to the paper leading edge matching portion 33d. The present invention is not limited to this configuration; a configuration may also be adopted wherein the number of sheets of paper in the paper feed cassette 33 is confirmed based on the value of a counter that counts the number of sheets printed. For example, a configuration may be adopted in which the counter is reset in a state in which paper is fully stored in the paper feed cassette 33, and afterwards the number of sheets of paper in the paper feed cassette 33 is confirmed by subtracting the number of sheets printed from the number of sheets when full.

Please amend the paragraph beginning at page 27, line 29, as follows:

In the above manner, in the present ~~invention~~technology, when forming an image, if there are not enough sheets of paper remaining to satisfy that request, without executing that image forming operation, a paper refill is awaited, and the image forming operation begins after that paper refill. When waiting for this paper refill, along with prompting the user for the paper refill, the paper feed cassette is popped out and the lack of paper can easily be confirmed. Thus, the user can, after sending an image forming request, immediately confirm that a refill of the storage medium (paper) is necessary, and immediately begin the work of refilling the paper without the need to confirm the status of the image forming apparatus. Thus, the activity of approaching the installed location of the image forming apparatus and confirming that there is no paper remaining, prior to going to get recording paper from the storage location of the recording medium, is no longer necessary. And, it is possible to allow the user to confirm the lack of paper within a short period of time after sending an image request signal from a terminal to the image forming apparatus. That is, after the user has sent an image request signal and before beginning separate work on that terminal, it is possible to prompt the user for a paper refill as necessary, and so it is possible to avoid temporarily interrupting work on the terminal.

Please amend the paragraph beginning at page 28, line 26, as follows:

The present invention may be embodied in other forms without departing from the gist or essential characteristics thereof. The ~~example~~embodiments disclosed in this application are to be considered in all respects as illustrative and not limiting. The scope of the invention is indicated by the appended claims rather than by the foregoing description, and all changes that come within the meaning and range of equivalency of the claims are intended to be embraced therein.

Please amend the paragraph beginning at page 29, line 8, as follows:

The present ~~invention~~technology is applicable to image forming apparatuses that can form an image; these are not limited to copy machines, printer and facsimile apparatuses, and the like.